

**Collaboration between Meteorological and Hydrological  
Services in the provision of improved Flash flood Forecast.  
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**Abstract**

The violent flow of water mass in steep topography with debris flow is the flash flood. It is normally caused by the high intensity Convective precipitation. The loss of life and property is reported now increasing all over the world by the flash flood. This killer event cannot be stopped or be removed, only its devastation be mitigated by issuing warning by the forecasters in well ahead of the occurrence. The challenging task of the forecaster is that the life cycle of a flash flood event is only 3-6 hrs. Hence the forecaster needs to know the temporal and spatial precipitation with accurate estimation for a meaningful lead-time and this atmospheric ingredients like the moist air, leading to clouds, precipitation and convection all are the elements of the science of Meteorology and thus a strong collaboration in between the hydrological services and the meteorological services is a must. Again a given rainfall because of its intensity and duration may dramatically be changed into flash flood depending on the soil moisture, topography and the section of the stream. Thus the flash flood event is the combination of the meteorology and hydrology.

Slight or heavy precipitation may occur according to the degree of instability of moist air and to the height and temperature reached. The vertical extend of the cloud may be up to 10 km or more. But when the instability conditions are well developed, enormous amounts of energy become available from the release of latent heat. Vertical velocities in up-currents may exceed 10m/sec and temporarily prevent even the largest raindrops from falling downward. Later they may be released if the vertical currents are interrupted. A violent rainstorm or cloudburst may occur causing serious flash flood on the ground. Down drafts speed of convection clouds (as much as 70 km/hr) or the delay in downdraft, condensation rate, why heavy downpour situation in space occurs, answer of all these weather events are to be known by the forecaster for his simulation approach. The area precipitation and point precipitation is another point of consideration for the forecaster. Because it is often found that in the same valley it rains with high intensity on one hillside and no rain on the other side. Again the potential flash flood producing storm structure seen from a geostationary satellite may be different from that seen by radar. The forecaster may have the reservation to select the simulation approach depending on the meteorological observation. In one of the case study of six flash flood events in USA, it was found that out of five simulations the NDD (no downdraft) produces the best rain pattern. Moreover like the traditional riverine forecasting model, flash flood should not be addressed because of their limitations. It is recommended that Hydrologist should select the flash flood model according to the research results on precipitation observation as well as basin size and characteristics.

It is very much clear that for an improved flash flood forecast the hydrologist has got little to do in the short span of time. Major activities are going on in the space with in the domain of the meteorologist. So a strong collaboration in between the Hydrology and Meteorology will definitely be required for a meaningful flash flood forecast with sufficient lead-time.

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